Appendix C

Emission Offsets

Pursuant to District Regulation 2, Rule 2, Section 302, offsets are required only for permitted sources. Therefore, emission offsets will be required for the NO_x, POC and PM_{10} emission increases associated with S-41 Gas Turbine, S-42 HRSG, S-43 Gas Turbine, S-44 HRSG and S-46 Cooling Tower only. Pursuant to District Regulations, emission offsets are not required for the NO_x and POC and emissions.

Table C-1 Emission Offset Summary

	NO_x	CO	POC	PM_{10}	SO_2
BAAQMD Calculated New Source Emission Increases[a] (ton/yr)	174.3	259.1	46.6	112.2	48.5
Offset Requirement Triggered	Yes	N/A	Yes	Yes	No
Offset Ratio	1.15[b]	N/A	1.15[c]	1.00	N/A
Offsets Required (tons)	**200.5**	**0**	**53.6**	**112.2[d]**	**0**

[a]Sum of Gas Turbine (S-41 and S-43) and HRSG (S-42 and S-44) emission increases.

[b]Pursuant to District Regulation 2-2-302, the applicant must provide emission offsets at a ratio of 1.15 to 1.0 since the proposed facility NO_x emissions from permitted sources will exceed 50 tons per year.

[c]Pursuant to District Regulation 2-2-302, an offset ratio of 1.15 applies since the facility POC emissions are greater than 50 tons per year (present plant #18 has POC emissions of 21.8 tons/year).

[d]PM_{10} will be offset with SO_2 at a ratio of 3 tons of SO_2 for 1 ton of PM_{10}. See Appendix C Attachment.

Appendix C Attachment

OCTOBER 18, 1999

TO: **PETER HESS** P. Hess 10/21/99

VIA: **TOM PERARDI** for TP 10/18

CC: **BILL DE BOISBLANC**
STEVE HILL
GLEN LONG
DENNIS JANG

FROM: **ROB DE MANDEL**

SUBJECT: **SO_2:PM_{10} OFFSET RATIO FOR DELTA ENERGY CENTER**

As we discussed last Friday, I have reviewed Glen long's 10/14/99 memo, the September 21, 1999 proposal from Sierra Research, and the 1992 SAI report.[1] I have the following comments:

1. As Glen Long pointed out, the Sierra Research analysis was based on annual average emissions and concentration data, while the SAI report analyzed a high PM_{10} winter episode. I agree with Glen that it is more appropriate to base the analysis on the winter episodes that result in the District's highest PM_{10} levels.

2. The SAI Report evaluated SO_2:PM_{10} tradeoff ratios for three Contra Costa County sites: Bethel Island, Concord and Pittsburg. They obtained a range of computed tradeoff ratios from 2.5:1 to 4.6:1. Their "best estimates" were 4:1 for Bethel Island and Concord, and 3:1 for Pittsburg. They recommended a "conservative best-estimate value" of 4:1 for eastern Contra Costa county. In my opinion, a reasonable alternative would be to average the three results, yielding a value of 3.67:1 for eastern CCC. For the Delta Energy Center, using the Pittsburg ratio of 3:1 would also be consistent with SAI's analysis.

3. I recommend that future determinations of SO_2:PM_{10} offset ratios for Bay Area sites outside of eastern CCC should be based on a methodology comparable to that used by SAI in the 1992 report.

---

[1] Gray, H. A. and M. P. Ligocki, 1992. *Analysis to determine the appropriate trade-off ratios between NO_x, SO_x, and PM_{10} emissions for the Shell Martinez Refinery,* SYSAPP-92/006, Systems Applications International, San Rafael, CA.

Appendix D

Health Risk Assessment

As a result of the combustion of natural gas at the proposed Gas Turbines and HRSGs and the presence of dissolved solids (heavy metals) in the cooling tower water, the proposed Contra Costa Unit 8 will emit the toxic air contaminants summarized in Table 2, "Maximum Facility Toxic Air Contaminant (TAC) Emissions". In accordance with the requirements of CEQA, the BAAQMD Risk Management Policy, and CAPCOA guidelines, the impact on public health due to the emission of these compounds was assessed utilizing the air pollutant dispersion model ISCST3 and the multi-pathway cancer risk and hazard index model ACE.

The public health impact of the carcinogenic compound emissions is quantified through the increased carcinogenic risk to the maximally exposed individual (MEI) over a 70-year exposure period. A multi-pathway risk assessment was conducted that included both inhalation and noninhalation pathways of exposure, including the mother's milk pathway. Pursuant to the BAAQMD Risk Management Policy, a project which results in an increased cancer risk to the MEI of less than one in one million over a 70 year exposure period is considered to be not significant and is therefore acceptable.

The public health impact of the noncarcinogenic compound emissions is quantified through the chronic hazard index, which is the ratio of the expected concentration of a compound to the acceptable concentration of the compound. When more than one toxic compound is emitted, the hazard indices of the compounds are summed to give the total hazard index. The acute hazard index quantifies the magnitude of the adverse health affects caused by a brief (no more than 24 hours) exposure to a chemical or group of chemicals. The chronic hazard index quantifies the magnitude of the adverse health affects from prolonged exposure to a chemical caused by the accumulation of the chemical in the human body. The worst-case assumption is made that the exposure occurs over a one-year period. Per the BAAQMD Toxic Risk Management Policy, a project with a total hazard index of 1.0 or less is considered to be not significant and the resulting impact on public health is deemed acceptable.

The results of the health risk assessment performed by the applicant and reviewed by the District Toxics Evaluation Section staff are summarized in **Table D-1**.

Table D-1
Health Risk Assessment Results

Source	Multi-pathway Carcinogenic Risk (risk in one million)	Non-carcinogenic Chronic Hazard Index	Non-carcinogenic Acute Hazard Index[a]
Gas Turbines, HRSGs, and Cooling Tower	0.66	0.04	0.2

[a]included for informational purposes only; the BAAQMD TRMP does not require an assessment the impact due to short-term (< 24 hour) exposure to non-carcinogenic toxic air contaminants

In accordance with the BAAQMD Toxic Risk Management Policy (TRMP), the increased carcinogenic risk and chronic hazard index attributed to this project are each considered to be not significant since they are each less than 1.0. The BAAQMD TRMP does not require an assessment the impact due to short-term (< 24 hour) exposure to non-carcinogenic toxic air contaminants, which is expressed as the acute hazard index.

Based upon the results given in Table D-1, the Contra Costa Unit 8 project is deemed to be in compliance with the BAAQMD Toxic Risk Management Policy.